

**CVX4241 Engineering Hydrology**

|  |  |
|--|--|
| <b>Level</b>                             | 4  |
| <b>Course Code</b>                       | CVX4241  |
| <b>Course Title</b>                      | Engineering Hydrology  |
| <b>Credit value</b>                      | 2  |
| <b>Core/Optional</b>                     | Core (Civil Engineering)   |
| <b>Course Aim/s</b>                      | To teach the principles of Hydrology and Risk Analysis so that the students can develop appropriate Hydrologic design parameters for infrastructure and carry out calculations related to Hydrologic systems.  |
| <b>Course Learning Outcomes (CLO):</b>   | <p>At the completion of this course student will be able to:</p> <p>CLO1: Explain concepts of risk and their application to engineering hydrologic design, select appropriate return periods and estimate threshold values for given return periods; [Uni-structural] [Multi-structural]</p> <p>CLO2: Calculate design floods using data on rainfall and catchment properties and explain the applicability and limitations of hydrologic models [Uni-structural] [Multi-structural]</p> <p>CLO3: Explain the scientific reasoning and uncertainties behind predictions of climate change and propose adaptation and mitigation measures suitable for Sri Lanka [Uni-structural] [Multi-structural]</p> <p>CLO4: Explain the governing equations of groundwater flow and solve simple problems with a variety of boundary conditions [Uni-structural] [Multi-structural]</p> <p>CLO5: Explain the geological background to groundwater resources in Sri Lanka, analyze the results of pumping tests to estimate aquifer parameters and water availability and explain the impacts of groundwater extraction [Uni-structural] [Multi-structural]</p>  |
| <b>Content (Main topics, sub topics)</b> | <p><b>Outline Syllabus:</b></p> <p>Unit 1: Hydrological Risks and Climate Change<br/>           Session 01: Introduction to risk management, Hydrological risks to infrastructure, Design floods<br/>           Session 02: Return periods and extreme value analysis<br/>           Session 03: Overview of global climate change, Implications for Sri Lanka, Adaptation and mitigation measures</p> <p>Unit 2: Estimation of Design Floods<br/>           Session 04: Analysis of rainfall data, Estimation of catchment rainfall, Losses and effective rainfall<br/>           Session 05: Rainfall runoff processes, Hydrograph analysis and synthetic unit hydrographs<br/>           Session 06: Flood routing – channel routing and reservoir routing<br/>           Session 07: Hydrologic models</p> <p>Unit 3: Groundwater Flow and Groundwater Exploration<br/>           Session 08: Geological background to Sri Lankan aquifers<br/>           Session 09: Groundwater calculations – analytical solutions and groundwater models<br/>           Session 10: Groundwater exploration and assessment, Well hydraulics and pump tests</p> <p><b>Laboratory Classes</b></p> <p>Measurement of Permeability<br/>           One-dimensional Groundwater Flow</p> |